

PATENT CLAIMS

1. A mixture for treating a soil surface and/or a soil mass, wherein the mixture is spread over the soil surface and/or arranged in the soil mass to be treated in such manner that a layer in the form of a film or membrane on the surface and/or some distance down in the soil to be treated is formed,

5 characterised in

- that the mixture comprises a basic powder mixture consisting of a water-soluble, dried and ground organic raw material, a film or membrane forming thickening agent and pigment; and

10 - that the basic mixture comprises at least one component which per se has a sufficient antioxidantising effect to ensure that the membrane has an antioxidantising effect on the surroundings.

2. A mixture according to claim 1,

15 characterised in that the powder mixture is saturated with electrons to at least electrical neutrality.

3. A mixture according to claim 2,

20 characterised in that the powder mixture is oversaturated with electrons and has an excess of negative electric charges.

4. A mixture according to claims 1-3,

characterised in that the basic mixture may also contain and constitute a growth medium for microalgae.

25 5. A mixture according to claims 1-3

characterised in that the basic mixture may be composed of from 1 to 50 parts by weight of organic raw material, 0.1 to 60 parts by weight of thickening agent and from 2-50 parts by weight of pigment.

30 6. A mixture according to claim 4,

characterised in that the basic mixture may also contain from 0.1 to 10 parts by weight of microalgae.

35 7. A mixture according to any one of claims 1 to 6,

characterised in that the organic material is any material originating from the natural environment, the animal or plant kingdom, and that, in a dried and ground state, it contains fibres and adhesive compounds so that the material will function as a binder in the resulting film or membrane.

8. A mixture according to claim 7

characterised in that the raw organic material consists of substantially natural, industrial and/or household organic or biological waste.

5 9. A mixture according to claim 8,

characterised in that the vegetable debris is dried and ground seaweed, sea grass and/or kelp, and that 3 to 6 parts by weight thereof are used in the basic mixture.

10 10. A mixture according to claim 9

characterised in that sea grass preferably comprises the species Spartina and/or reeds.

11. A mixture according to any one of claims 1 to 10,

15 characterised in that the thickening agent is xanthan or xanthan gum.

12. A mixture according to claim 11,

characterised in that the thickening agent is one or more alginates that are admixed and replace at least a part of the xanthan or xanthan gum, or that 20 the one or more alginates replace all the xanthan or xanthan gum.

13. A mixture according to claim 11,

characterised in that the xanthan or xanthan gum is added in an amount of from 0.1 to 6 parts by weight.

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14. A mixture according to any one of claims 1 to 13,

characterised in that when it is desired to form a film or membrane having a high degree of reflection, one or more of the following materials in dry powder form are used as pigments: stone, lime, sand, clay, chalk, shells, white 30 mineral pigments such as TiO₂, white plant dyes and/or white plant fibres such as cotton, bog cotton or algae-based components having light characteristics.

15. A mixture according to any one of claims 1 to 13,

characterised in that when it is desired to form a film or membrane having a low degree of reflection, one or more of the following materials in dry power form are used: ash, coal, soot, carbon black, graphite and other known forms of elementary carbon and other pigments such as ochre, bone, animal shells, marine shells, fish-scales, mineral pigments, plant dyes, plant pigments or algae-based components having dark characteristics.

16. A mixture according to 14,
characterised in that the pigments are added in an amount of from 0.1 to 25 parts by weight, preferably from 0.1 to 10 parts by weight.

5 17. A mixture according to claim 15,
characterised in that the pigments are added in an amount of from 0.1 to 25 parts by weight, preferably from 0.1 to 10 parts by weight.

10 18. A mixture according to any one of claims 1 to 13,
characterised in that the basic mixture has added thereto one or more of the following additives: binders, preservatives, fertilisers, water stabilisers, mineral salts, pH regulators, antioxidants and/or electrically conductive substances.

15 19. A mixture according to claim 18,
characterised in that the additives are also selected from substances or compounds which can be obtained in the form of natural, industrial and/or household organic or biological waste, and which preferably act as antioxidants.

20 20. A mixture according to claim 18,
characterised in that the binders comprise organic glue and adhesive agents having a high protein content, preferably albumin glue, casein glue, animal glue, agar, alginic acid, ground acorn barnacles, latex and/or sap.

25 21. A mixture according to claim 20,
characterised in that the binders are added in an amount of from 0.1 to 15 parts by weight, preferably 0.1 to 5 parts by weight.

30 22. A mixture according to any one of claims 18 to 21,
characterised in that the binders further comprise one or more fibres selected from the group consisting of cellulose fibre, plant fibre, textile fibre, animal fibre and reinforcing fibre.

35 23. A mixture according to claim 22,
characterised in that the fibre materials are added in an amount of from 0.5 to 30 parts by weight.

40 24. A mixture according to any one of claims 18 to 23,
characterised in that the fertiliser agents comprise one or more fertilisers selected from the group consisting of animal manure, fish guano, guano, urea, inorganic nutrient salts and micronutrients.

25. A mixture according to claim 24,
characterised in that the fertiliser materials are added in an amount of from 0.1 to 20, preferably 0.1 to 15, and more preferably 0.1 to 5 parts by weight of dry powder.

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26. A mixture according to any one of claims 18 to 25,
characterised in that the electrically conductive additives comprise one or more substances selected from the group consisting of readily soluble mineral salts, ash and/or carbon fibres.

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27. A mixture according to claim 26,
characterised in that the electrically conductive substances are added in an amount of from 0.1 to 15, preferably 0.1 to 5 parts by weight of dry powder.

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28. A mixture according to any one of claims 18 to 27,
characterised in that the water stabilisers comprise one or more substances selected from the group consisting of plant oils, mucilage, organic waxes and organic oils.

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29. A mixture according to claim 28,
characterised in that the water stabilisers are added in an amount of from 0.1 to 80, preferably from 0.1 to 25, and more preferably from 0.1 to 5 parts by weight of dry powder.

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30. A mixture according to any one of claims 18 to 29,
characterised in that the pH regulators comprise one or more substances selected from the group consisting of sap, basic minerals, ash, and salts of the alkaline and alkaline earth metals.

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31. A mixture according to claim 30,
characterised in that the pH regulator is added in an amount of from 0.1 to 50, preferably from 0.1 to 10.

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32. A mixture according to claim 31,
characterised in that the pH regulators are added in such quantity that the resulting membrane or film has a pH that is greater than 5, preferably in the range of pH 5 to 10.

33. An erosion-moderating mixture, wherein the mixture is spread over the soil surface to be treated in such a manner that a layer in the form of a film or membrane is formed on the surface,

characterised in that

5 - the mixture comprises a pure binder solution consisting of from 95 to 99.7% by weight water and from 0.3 to 5% by weight alginic acid

34. Use of the mixture according to any one of the preceding claims to form a solid film or membrane in the surface and/or in a layer at a given depth in a soil mass for the purpose of regulating/optimising the conditions to promote growth of

10 vegetation.

35. Use of the mixture according to any one of claims 1-33 to form a solid film or membrane in the surface of a soil mass for the purpose of binding loose surface particles and thereby reduce the local soil erosion.

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36. Use of the mixture according to any one of claims 1-32 to form a solid film or membrane in the surface of a soil mass for the purpose of forming a decorative cover.

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37. Use of the mixture according to any one of claims 1-33 to form a solid film or membrane in the surface of a soil mass for the purpose of altering the albedo of the soil surface.

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38. Use according to claim 37, where the purpose of altering the albedo is to reduce the heating of and thus the air temperature immediately above a ground surface by reducing the degree of absorption of incident sunlight exhibited by the ground surface.

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39. Use of the mixture according to any one of claims 1-33 to form a solid film or membrane in the surface of a soil mass with the purpose of lowering the albedo of the soil surface in a limited area to obtain local heating of the covered soil surface with the object of forming upward currents of air above this area.

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40. Use of the mixture according to any one of claims 1-33 to form a solid film or membrane in the surface of a soil mass for the purpose of acting as a growth-inhibiting membrane on a fire corridor in dense vegetation and/or to function as a non-combustible surface membrane or film.

41. Use of the mixture according to any one of claims 1-33 to form a solid film of membrane in the surface of a soil mass for the purpose of binding loose surface particles and thus reducing local soil erosion.

5 42. Use of the mixture according to any one of claims 1-33 to recreate cultivation conditions in order to re-establish vegetation in areas that have become too cold, too hot, too dry etc.

10 43. Use of the mixture according to any one of claims 1-33 to regulate/lower the CO₂ respiration rate and thus the amount of CO₂ that is released per time unit from the biomass in a soil.

15 44. Use of the mixture according to any one of claims 1-33 to form a solid film or membrane in the surface of a soil mass for the purpose of reducing water loss from the soil surface in the form of evaporation.

20 45. Use of the mixture according to any one of claims 1-33 to form a solid film or membrane at a given distance or depth in a soil mass for the purpose of forming a water-impermeable membrane or film with the object of reducing water runoff to deeper soil layers.

46. A method of adjusting the albedo in an upper layer of a solid surface on the earth,

characterised in that it comprises:

25 - using the basic mixture according to one of claims 13 to 16, and adapting the proportion and type of pigments added to the basic mixture in order to produce the desired albedo;

- adding additives such as disclosed in one or more of claims 17-31; and

30 - using the mixture to form a surface membrane or film having the desired albedo on the surface to be treated.

47. A method of reducing the CO₂ respiration rate of a biomass in a soil mass, characterised in that it comprises:

35 - using the basic mixture according to one of claims 13 and/or 15;

- adding additives such as disclosed in one or more of claims 17 to 32; and

- using the mixture to form a surface membrane or film having a relatively high albedo so that the temperature in the soil is lowered as a result of less absorption of incident sunlight.

48. A method of re-establishing vegetation in an area, characterised in that it comprises:

- using the basic mixture according to one of claims 1 to 16;
- adding additives such as disclosed in one or more of claims 17 to 32; and
- using the mixture to form a surface membrane or film having an adjusted albedo so that the temperature in the local soil masses does not exceed and/or fall short of the comfort temperature for the roots of local natural plant and vegetation varieties.

10 49. A method according to claim 48,

characterised in that it further comprises:

- actively planting or sowing new plant or vegetation varieties in combination with laying out the membrane.

15 50. A method according to claim 48 or 49,

characterised in that it further comprises:

- adapting the amount of water-stabilising substances in order to obtain a surface membrane or film that has desired water permeability levels to reduce water loss/drying out of the soil mass.

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51. A method according to one of claims 47 to 49,

characterised in that it further comprises:

- laying a membrane or film which lies immediately under the roots of the vegetation and which has little water permeability in order to reduce or eliminate water loss to the deeper layers of soil.

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52. A method for preventing re-establishment of vegetation in an area,

characterised in that it comprises:

- using the basic mixture according to one of claims 1 to 17;
- adding additives such as disclosed in one or more of claims 18 to 32, but with a relatively high proportion of binders and water-stabilising additives to form a strong membrane or film that is impenetrable to seed-germinating species and that is relatively weather and wear resistant; and
- using the mixture to form a surface membrane or film in the area to be treated.

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53. A method according to claim 52,

characterised in that it further comprises:

- adding mineral salts to a minimum concentration of 300 ppm or more to render the membrane or film unsuitable for germinating seeds.

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54. A method for forming a fire-retardant corridor in vegetated areas, characterised in that it comprises:

- removing existing vegetation;
- using the basic mixture according to one of claims 1 to 17;
- 5 - adding additives such as disclosed in one or more of claims 18 to 32, but with a relatively high proportion of binders and water-stabilising additives to form a strong membrane or film that is impenetrable to seed-germinating species and that is relatively weather and wear resistant, and by using water stabilising substances with a relatively low content of combustible wax or oils; and
- 10 - using the mixture to form a surface membrane or film on the area from which the vegetation has been removed.

55. A method according to claim 54,

characterised in that it further comprises:

- 15 - adding mineral salts to a minimum concentration of 500 ppm or more to render the membrane or film non-combustible.

56. A method for establishing desired plant growth whilst preventing the establishment of unwanted vegetation,

20 characterised in that it comprises:

- removing existing vegetation in the area to be treated and ready the area for new planting;
- using the basic mixture according to one of claims 1 to 17;
- adding additives as such disclosed in one or more of claims 18 to 32;
- 25 - adding seeds of the desired plant variety to the mixture; and lastly,
- using the mixture to form a surface membrane or film on the area from which the vegetation has been removed and thus obtain a combined effect that the film or membrane holds in place the desired seeds so that they have time to germinate and become established whilst other unwanted air-transported seed types are prevented from becoming established by the same film or membrane.